PRELIMINARY NOTE ON THE DEVELOPMENT OF A HUMAN TRYPANOSOME IN THE GUT OF *STOMOXYS NIGRA*

BY

J. W. SCOTT MACFIE, M.A., M.B., CH.B.

WEST AFRICAN MEDICAL STAFF

(*Received for publication* 14 *September*, 1913)

The rôle of *Stomoxys* in the transmission of trypanosomiasis has been much discussed. The Sleeping Sickness Commission of the Royal Society performed many experiments to determine whether this insect could transmit *T. pecorum*. All the experiments were unsuccessful, and Sir David Bruce and his collaborators concluded that 'It will therefore require very convincing proof to bring this Commission to the belief that *Stomoxys* are carriers of this disease.'[1] A similar conclusion was arrived at by Bevan,[2] in Southern Rhodesia, who failed to infect sheep with the Hartley trypanosome by means of *Stomoxys* flies. On the other hand, Bouet and Roubaud,[3] in French West Africa, succeeded in transmitting *T. cazalboui*, *T. pecaudi*, *T. sudanense*, and *T. evansi* by means of *Stomoxys* (probably *S. calcitrans*). They did not, however, observe any developmental forms in the digestive tract or proboscis of the insect, and although they considered the species of fundamental importance in the etiology of trypanosomiasis, they were not able to regard it as a typical intermediary host. In Northern Nigeria also this genus has fallen under suspicion, and the writer has recorded one case in which an infection with *T. brucei* (*pecaudi*) was probably conveyed to a horse by *Stomoxys nigra* or *Stomoxys calcitrans*.[4]

Last May, the writer had an opportunity of experimenting with flies of this genus at the Medical Research Institute, Lagos. As he succeeded in breeding *Stomoxys nigra* in captivity, it was hoped to investigate thoroughly the rôle of this insect in the transmission of trypanosomiasis. The experiments were however interrupted, and

as it seems unlikely that they can be resumed for some time, the following incomplete records are given by way of a preliminary note.

Towards the end of May, and at the beginning of June, 1913, a number of *Stomoxys nigra* flies, caught in the laboratory, were fed on a guinea-pig infected with the trypanosome from a case of sleeping sickness from Eket in Southern Nigeria. The morphology of this trypanosome, which is being described elsewhere, differed in several respects from that of *T. gambiense*. Thirteen of the flies were dissected from one to six days after the first infecting feed. In six of them flagellates (Herpetomonas) were found in the mid-gut. As a control, twelve flies that had not fed on the infected animal were dissected. No flagellates were found in them.

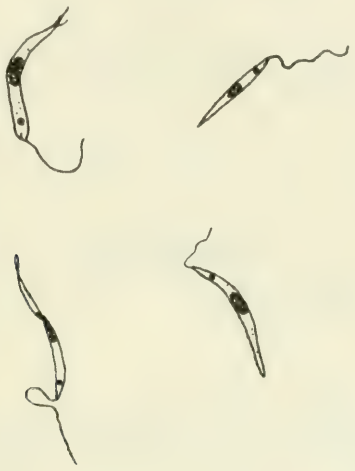
Unfed Flies			Fed Flies		
Number Dissected	With flagellates in the gut	Without flagellates in the gut	Number Dissected	With flagellates in the gut	Without flagellates in the gut
12	0	12	13	6	7

From these observations it was thought probable that the presence of the flagellates in the mid-gut must be due to the infecting feeds on the guinea-pig. As, however, it was possible that the flies might have been naturally infected, experiments were begun with flies hatched out in the laboratory.

Experiment 1. On June 14th a *Stomoxys nigra* fly that had hatched out on the previous day was fed on the infected guinea-pig. On June 17th the fly was killed and dissected. Herpetomonas were found in the mid-gut. No flagellates were present in the salivary glands and proboscis. The attached sketches, drawn with a camera lucida, illustrate some of the flagellates found in the mid-gut of this fly.

Experiment 2. On June 28th a *Stomoxys nigra* fly which had hatched out the previous day was fed on the infected guinea-pig. On July 2nd the fly died, and was dissected. Herpetomonas were found in its mid-gut. No flagellates were seen in the salivary glands and proboscis.

Each fly received only a single infecting feed. Two other specimens of *Stomoxys nigra* that had been bred out in the laboratory, but had not been fed on the infected guinea-pig, were dissected. No flagellates were found in either of them.



Herpetomonas (× 1000) from gut of *Stomoxys nigra*.

At this stage the experiments had to be abandoned. Some apology is necessary for recording such incomplete observations. The two experiments given above were, however, quite definite, and would seem to prove that the trypanosome with which the guinea-pig was infected was capable of development in the gut of *Stomoxys nigra*. I am not aware that this fact has previously been established, and its importance must be my excuse for publishing this note. In Nigeria, in the native towns and European stations, *Stomoxys* flies abound. If, as appears probable, they are capable of serving as the intermediary host of human trypanosomiasis, they deserve greater consideration than they at present obtain.

MEDICAL RESEARCH INSTITUTE,
LAGOS,
SOUTHERN NIGERIA,
August, 1913.

REFERENCES

1. Proc. Roy. Soc., 1910, B. 558, pp. 468-479.

2. Sleeping Sickness Bureau Bulletin, II, p. 252.

3. G. Bouet et E. Roubaud. Expériences de Transmission des Trypanosomiases animales de l'Afrique Occidentale française par les Stomoxes. Bull. Soc. Path. Exot., 1912, v. No. 7, pp. 544-550.

4 Ann. Trop. Med. & Parasit., 1913, VII, No. 1, p. 9.